

THE NEW DIGITAL POWER

Enlightening Innovation For A Future Sustainable Energy

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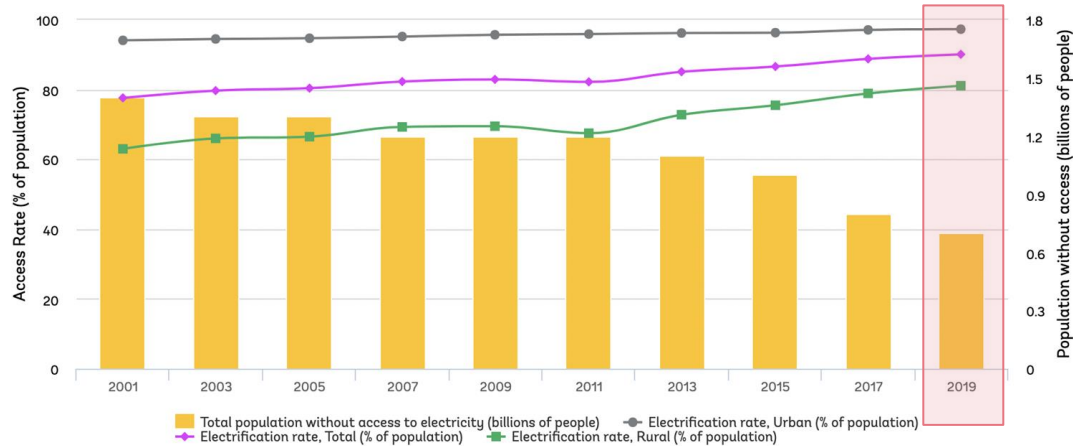
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Cambodia Academy of Digital Technology



The World

is making progress towards achieving universal access to electricity

90 percent of the planet's population was connected in 2019.



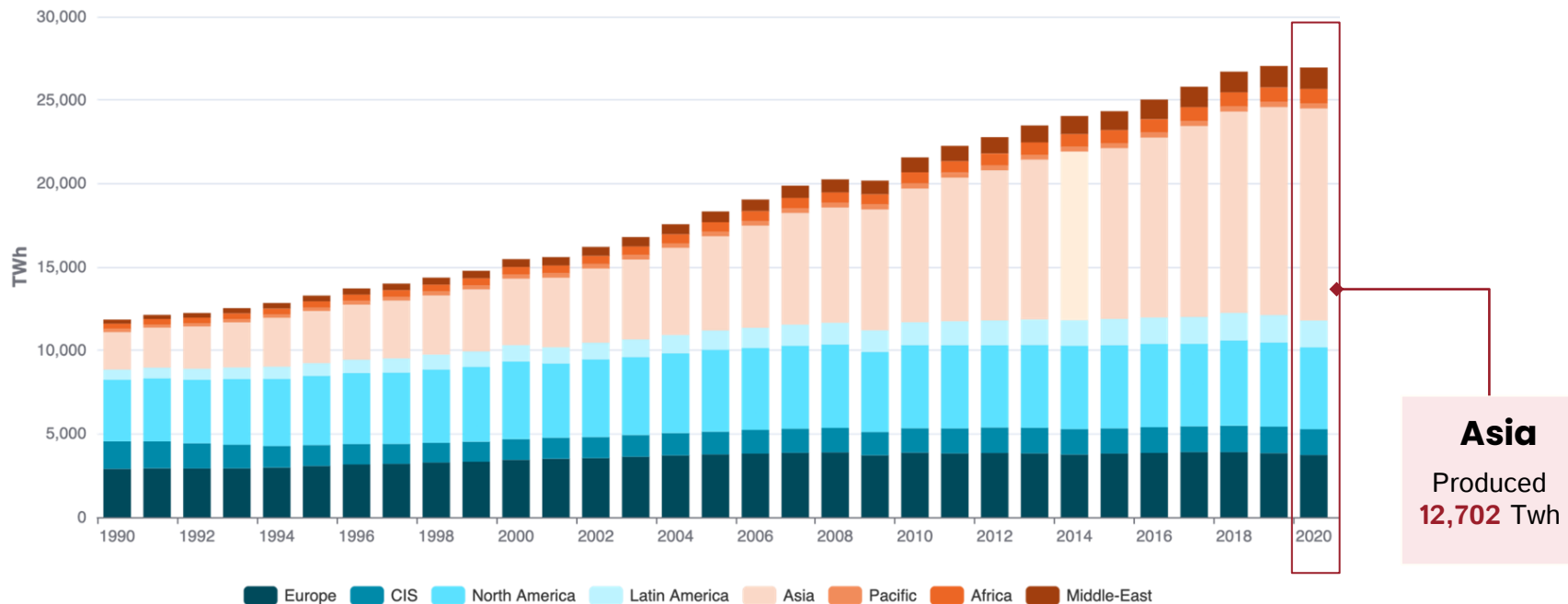
2020

7.7 Billion People

Needed 156,000 TWh



Global Energy Production

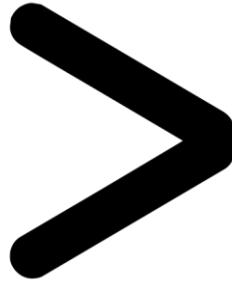
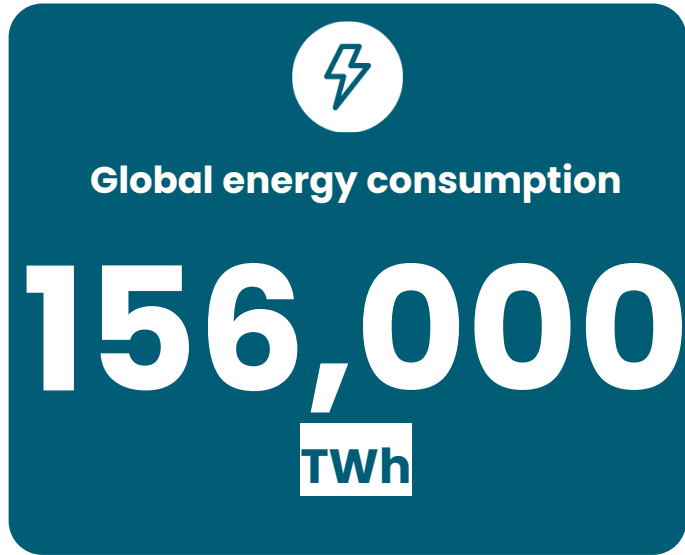


Around 27,000 Kwh of electricity

has been produced in 2020 which is equal to **+0.77%** growth of global primary energy production, comparing to the year of 2018.

Comparison

Between Global Energy Consumption VS. Global Energy Production in 2020



ASEAN is attempting to expand the number of people who have access to energy.

95%

of population in Southeast Asia
could access to electricity.

6 Countries

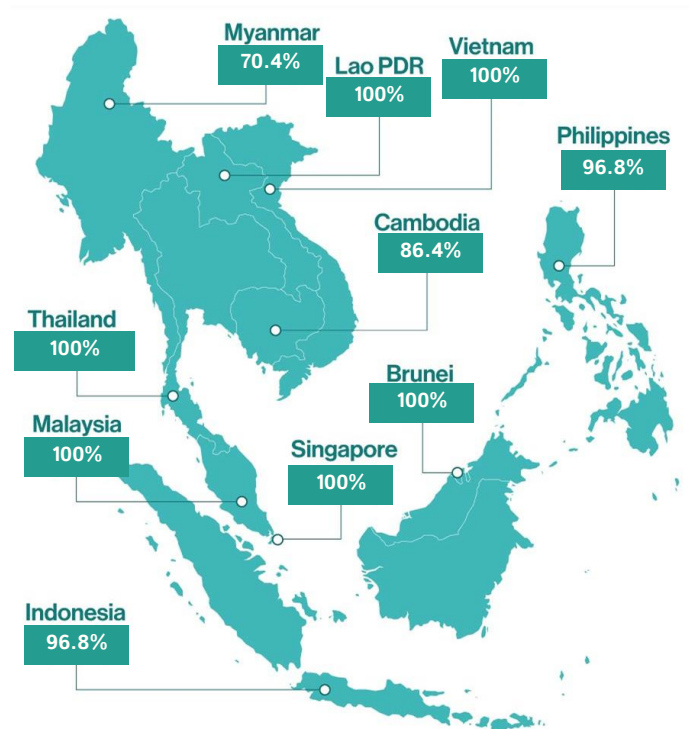
in ASEAN are fully access to
electricity.

86.4%

of Cambodian could
access to electricity.

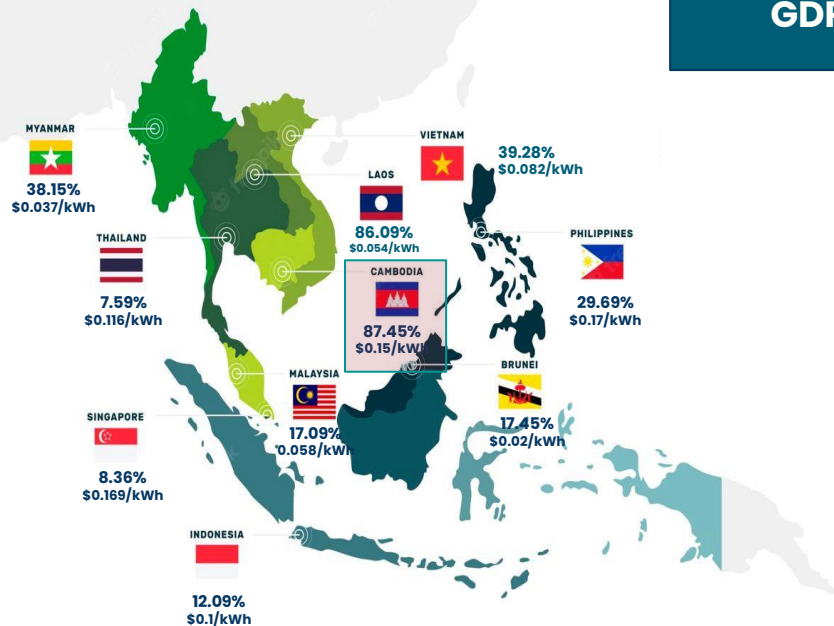
70.4%

of Myanmarese could
access to electricity.



Source : World bank 2020

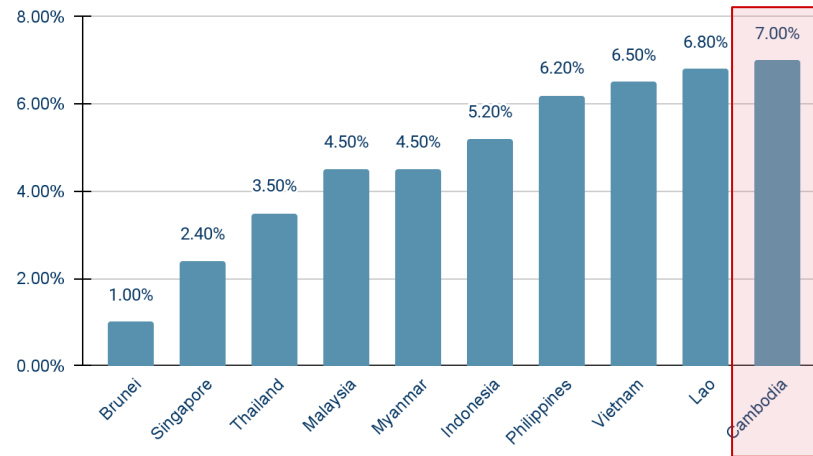
GDP growth leads to an increase in ENERGY DEMAND



87.455% ↑

increased of the electricity consumption in Cambodia between 2015 and 2019.

ASEAN GDP Growth 2019

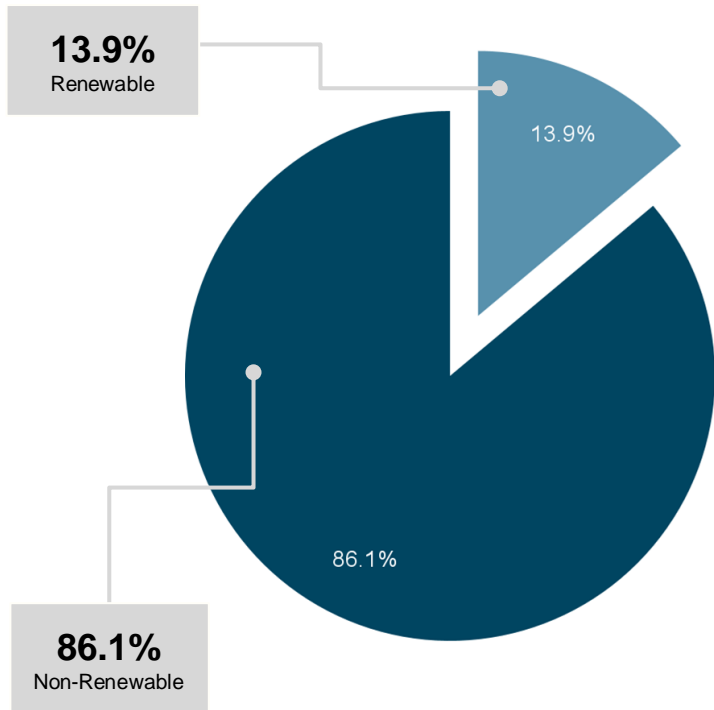


7% ↑

of Cambodia GDP which is the highest growth in Southeast Asia by 2019

The ASEAN region needs to enhance the use of renewable energy.

Total Primary energy supply in 2019



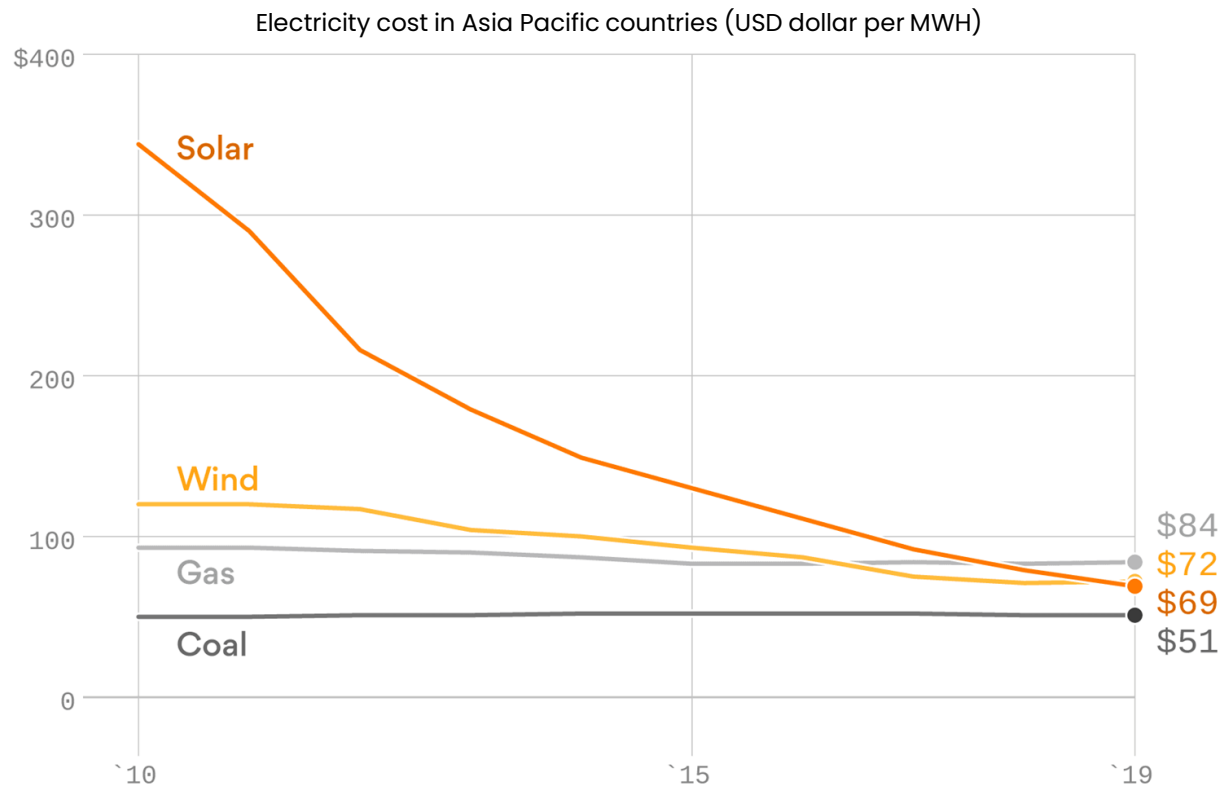
ASEAN plans to raise renewable energy sources.



23%
of renewable energy in
the total primary energy
supply.

35%
of renewable energy in
the ASEAN installed
power capacity.

Electricity cost from various source from 2010 to 2019



Solar

price dramatic decline
over almost 10 years.

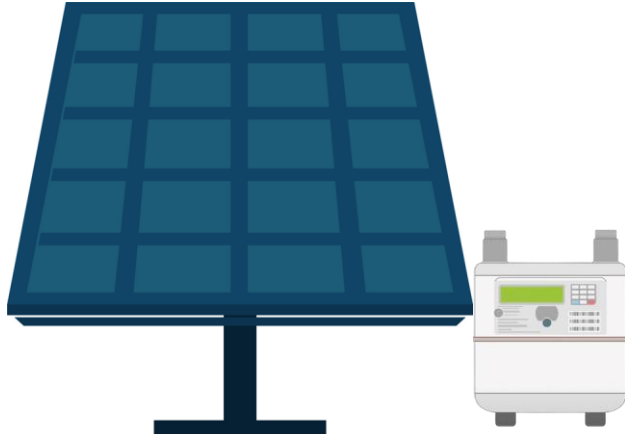
69 USD

is the price of solar which is the
lowest price if we compare with
other renewable energy.

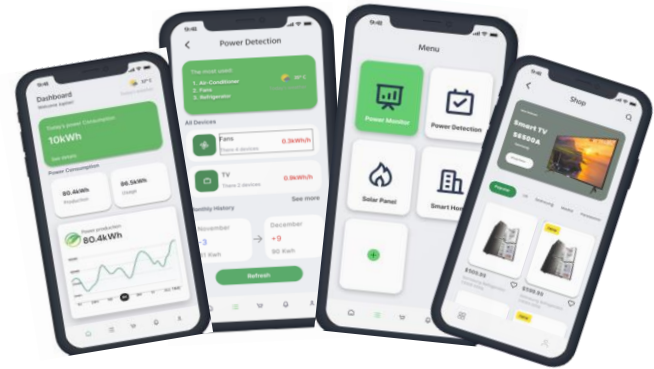
Source : weforum.org

Recommendation

Innovative Energy Solutions for Lower Income People in ASEAN Country



Smart Energy Hardware



Smart Energy App

A smart solar grid solution for monetary savings and environmental sustainability



Pricing Strategy



Package 1

- Solar Tracker
- Application
- Smart Meter
- Inverter



2

1 – 3 Kwh/day

\$419



Package 2

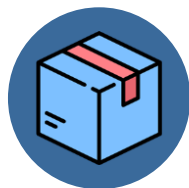
- Solar Tracker
- Application
- Smart Meter
- Inverter



3-6

4 – 6 Kwh/day

\$949



Package 3

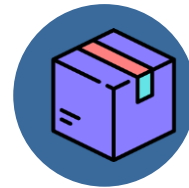
- Solar Tracker
- Application
- Smart Meter
- Inverter



7+

+10 Kwh/day

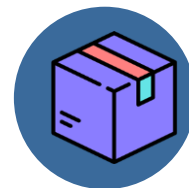
\$1,799



Package 4

Application

\$2.99/Year



Package 5

Custom Price

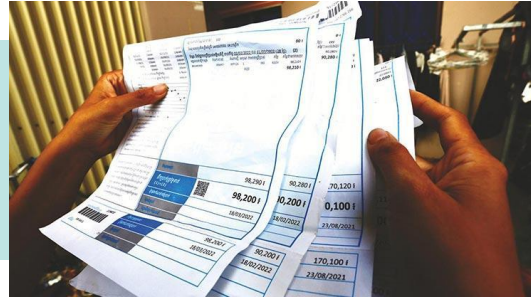
Use Case : 110 Families in Steung Chrov villages

Is able to access to electricity under the funding of **Okra**



Accessibility

Enough electricity is available for
whole village



Cost Reduction

Downscale the monthly expand
from **\$7.30 to \$2.5**



Business Growth

Upscaling their small-size
family business

Smart Energy

Will be more feasible with the joint of each stakeholder

Primary Contributors



SOLAR INDUSTRY

- include **project developers, component manufacturers, and other trade laborers**
- help local governments understand value, reduce barriers to solar development. and ensure quality control in the market



LOCAL GOVERNMENT OFFICIALS

- shape and guide a community's strategies for solar energy development.
- determine what level of solar deployment is optimal for the community, and what supporting policies are needed to achieve it.



HOUSEHOLDS AND BUSINESSES

- Financially support by purchasing the product and providing feedback for future development

Secondary Contributors



FINANCIAL INSTITUTIONS

- Typically provide loans and equity for those looking to install solar.



COMMUNITY GROUPS

- Include in **local area, Asean and global**
- Praise the renewable energy push especially solar PV and expand networking



ELECTRIC UTILITIES

- have the final say on the interconnection of renewable energy resources within their service territories.



INVESTORS

- Fund on the project include R&D, Operation, technology and financial support

Implementation Strategies

to explore, and bring certainty to the uncertain ASEAN

INPUT

R&D Scholarship and Internship with the related Field

TARGET

University and Colleges

PROCESS

- Provide Tech Mentoring
- Electricity Training
- Job Opportunity

FEASIBILITY



Knowledge Expansion

In Partner with



CADT

Innovation and way for smart effective grid

City and Rural Area in Cambodia

- More electrification
- Researcher and it's R&D
- Implementing the solution for pilot testing
- Structuring the stakeholder gathering



Smart Light using in Household and business

Sustainable Asean Community

Asean Region

- Integration to all Southeast Asian Countries
- Expand the partnership



PROMOTE ACCESS TO RESEARCH, TECHNOLOGY AND INVESTMENTS IN CLEAN ENERGY

The Recommendation

Enlightening Innovation for a sustainable energy future

Addresses UN-SDG



Ensure access to
**Affordable ,
Reliable and
Modern energy for
all**

Reduce The
**Environmental
Impact of Cities &
Inclusion and
Sustainable
Urbanization**



SDG 7 & SDG 11

Is Anchored with



B.8. Sustainable Economic Development
C.4. Energy



B.2. Equitable Access for All
C.2. Environmentally Sustainable Cities
C.3. Sustainable Climate



Action 1.1. Intensify the engagement of academe, private sector and relevant partners in the planning, implementation and assessment of joint undertakings in human resource development, and research and development.

Action 2.2. Establish scholarship, fellowship and/or attachment programs for students, researchers and other STI personnel.

Action 4.5. Engage relevant stakeholders in developing and implementing an effective communication and STI enculturation plan.

By implementing Smart Energy

We believe that it's going to give the positive impact



Economic

- Decrease **60%** of the electricity Expansion for **the household and business** usage
- Save **\$20,520**
- Create more than **120 new green job opportunities**



Human Development

- Enable accessibility to better health conditions, food security, women empowerment communication services as well as lighting and information



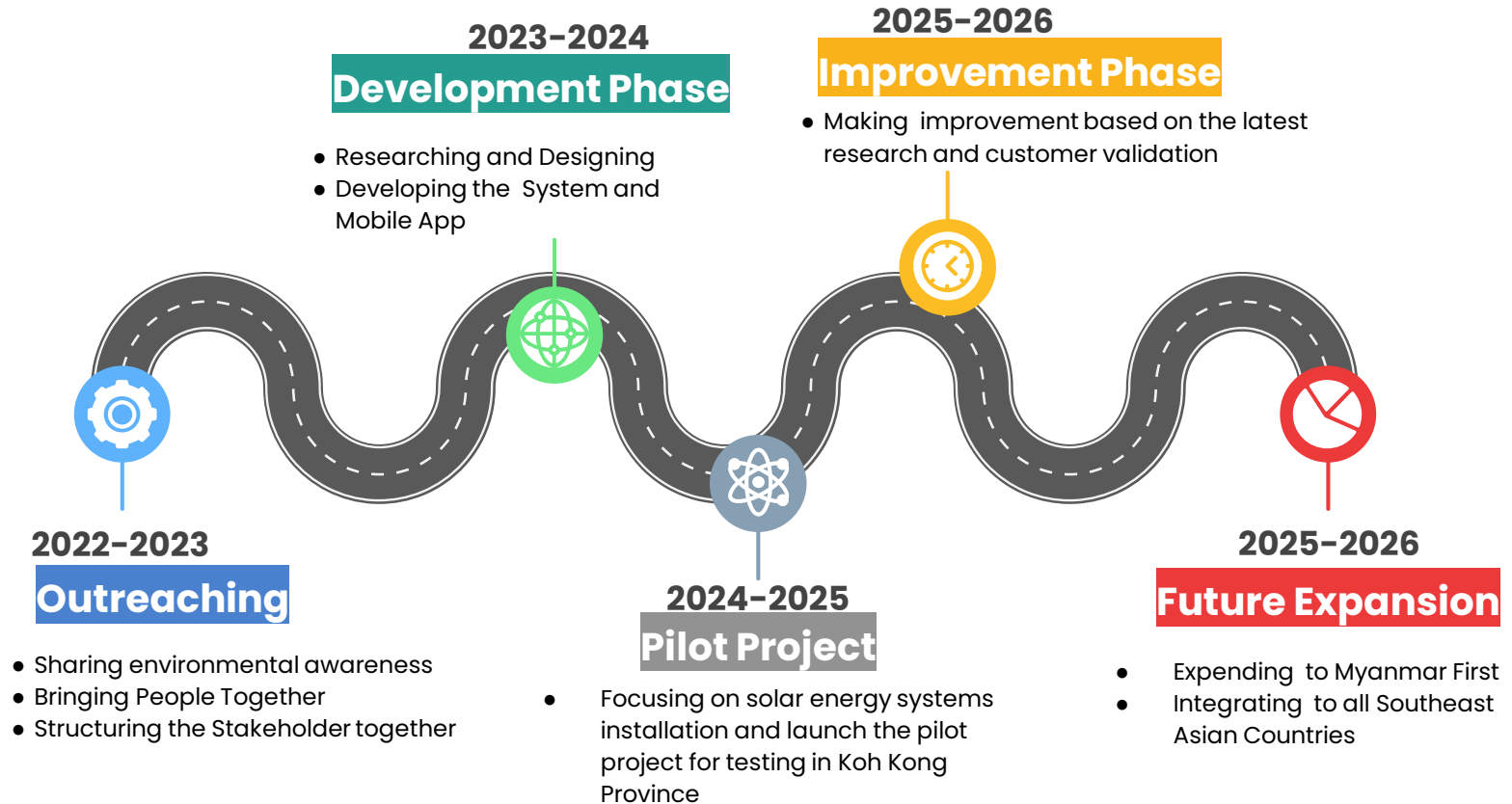
Environment

- Reduce **18.24 tons of CO2 emissions**
- Enable safe potable water
- Prevent climate change.
- Improve air quality of life.

Our First-Year Goal :
100 devices

Implementation Roadmap

Of Smart Energy for the upcoming years



A miniature model of a house with solar panels on the roof, surrounded by greenery and utility poles in the background. The house is white with a dark roof and blue windows. There are palm trees and other plants around it. In the background, there are utility poles and a yellow object hanging from one of them.

Thank You!!

"A transition to clean energy is about making an investment in our future."

Reference

Southeast Asia Energy Outlook 2019

<https://www.iea.org/reports/southeast-asia-energy-outlook-2019>

ASEAN Power Updates 2021

<https://aseanenergy.org/asean-power-updates-2021/>

Can Southeast Asia keep up with growing energy demand?

<https://www.weforum.org/agenda/2019/asean-southeast-asia-energy-emissions-renewables/>

Electricity Consumption dataset

<http://data.un.org/Data.aspx?q=electricity&d=EDATA&f=cmID%3aEL>

IEA, Cumulative energy savings in buildings from widespread digitalisation in selected countries, 2017–2040, IEA, Paris

<https://www.iea.org/data-and-statistics/charts/cumulative-energy-savings-in-buildings-from-widespread-digitalisation-in-selected-countries-2017-2040>

Final energy consumption in end use sectors for ASEAN

https://www.researchgate.net/figure/Final-energy-consumption-in-end-use-sectors-for-ASEAN-in-the-IEA-ETP-B2DS-showing-the_fig7_345258134

Energy tracker asia

<https://energytracker.asia/why-solar-energy-can-help-indonesia-attain-green-electricity-by-2050/>

Access to electricity dataset

<https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS>

<https://cleanenergynews.ihsmarkit.com/research-analysis/southeast-asia-to-renew-efforts-to-boost-renewable-capacity-in.html#:~:text=ASEAN%20is%20targeting%20a%2023,intensity%20reduction%20from%202005%20levels.>

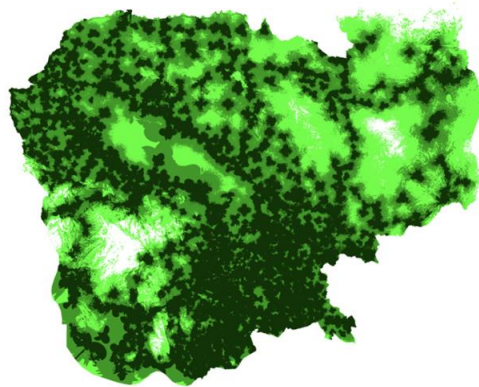
A decorative graphic on the left side of the slide. It consists of a 5x5 grid of squares. The squares alternate between dark teal and light gray. Each square contains a circle that is split vertically: the left half is white and the right half is teal. The circles are centered within their respective squares.

Backup Slide

Smart Energy					
	2023	2024	2025	2026	2027
Expense					
Office Supply	100	100	150	150	200
Mobile application development	400	600	700	800	1000
Website development	500	600	700	800	1000
Solar Development	1000	1500	2000	2200	2500
Fix cost					
Rent	3000	3000	3000	3000	3000
Salary	9600	13200	13200	13200	16800
Utility Expense	900	900	950	950	1000
Appstore	100	100	100	100	100
Play Store	25	0	0		0
Variable Cost					
Marketing	0	600	600	600	700
Tax	250	270	270	270	300
TOTAL	16075	20970	21770	22170	26700

How can people in rural area use ur system if there is no internet connection ?

Smart Axiata Coverage in Cambodia



2G

98.5%

3G

81.4%

4G

91.5%

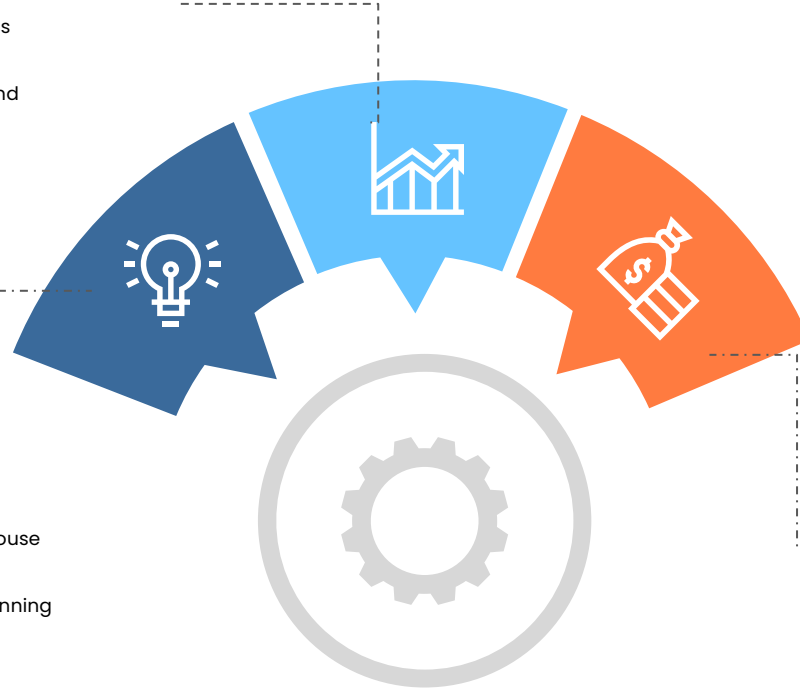
Implement Strategies

Renewable Energy Awareness

- Create Campaign to promote the usefulness of smart energy management
- Small bootcamp which including training and implementing competition with Technology
- Educate in all kind of activities including physical and online event , podcast, etc

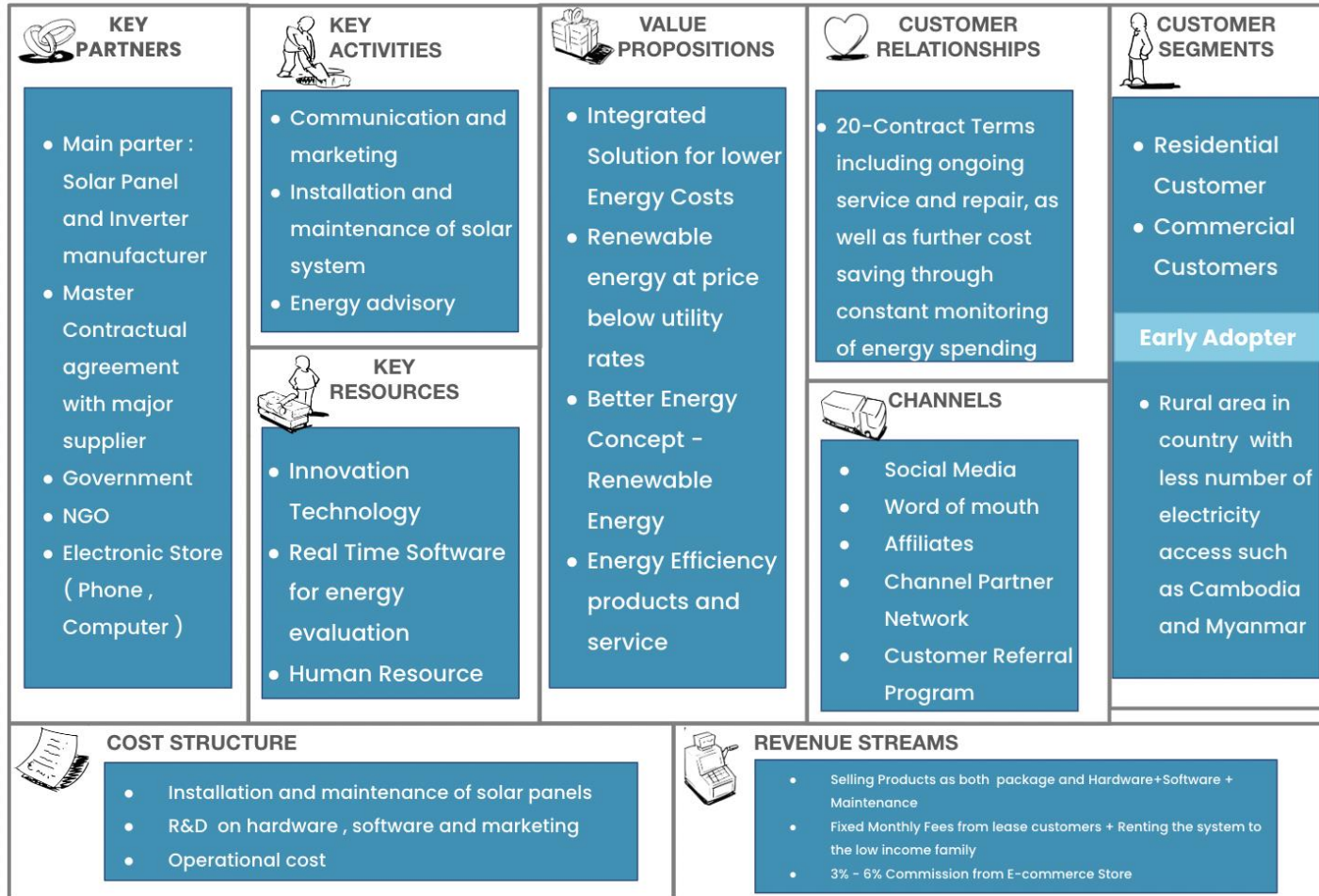
Tech Facilitation

- Internet of Things, guiding to new digital era introducing smart City basically on smart house management and smart electric
- Artificial intelligence with the process of scanning device and how it detects and analysis



Investment

- Government favors of tax on importing solar panel and machine into the country
- Government helps encourage and introduces our project to the investor
- More funding will be allocated for research and development.
- Market integration of distributed energy resources



The influence of solar energy

173 000 TWH

of incoming solar radiation in
the upper atmosphere in
every hour.

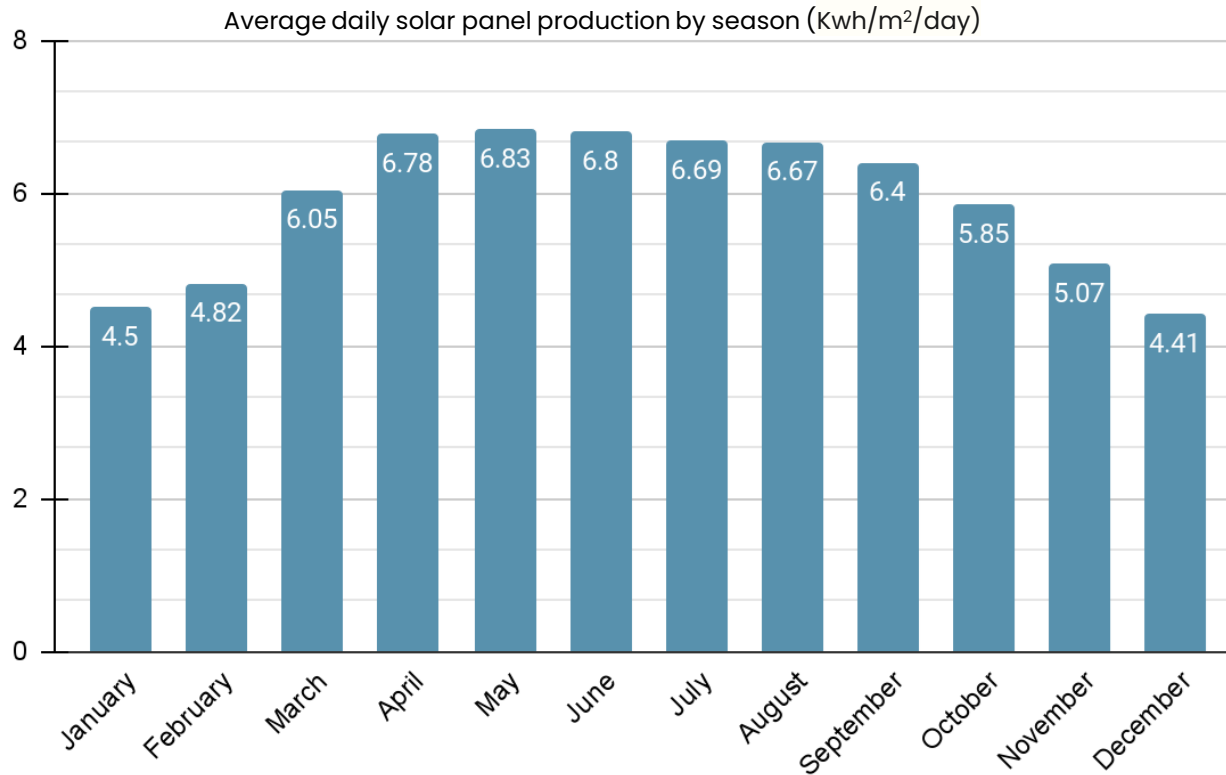
10,000 times

higher than the world's total
energy use.



Source : MIT physics professor Washington Taylor

Solar Panel performance vary by season



5.9

Kilowatt hour are average production in overall.

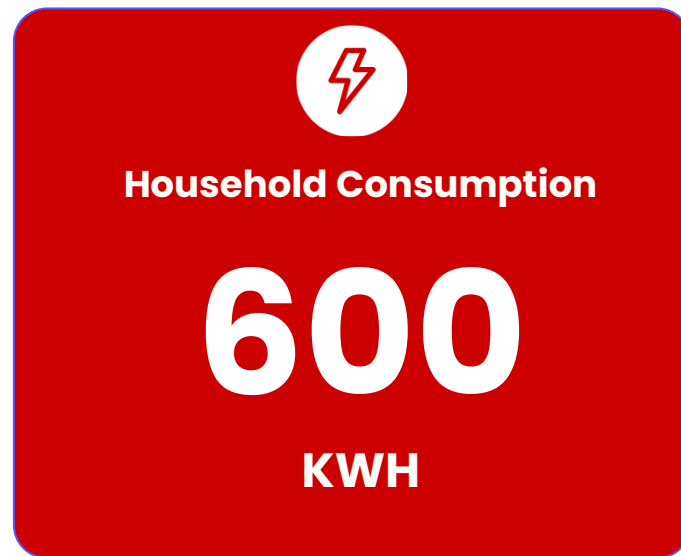
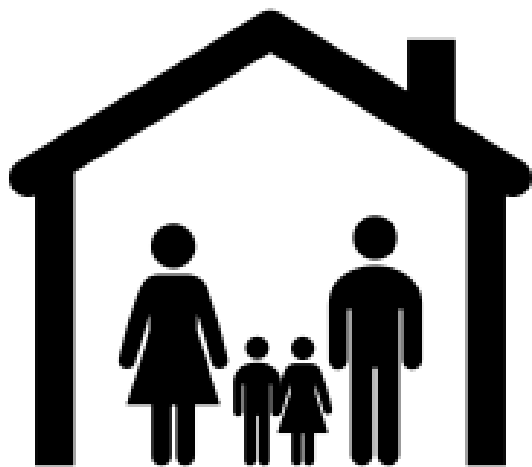
4.41

Kilowatt hour are an average production in December which is the lowest one.

6.83

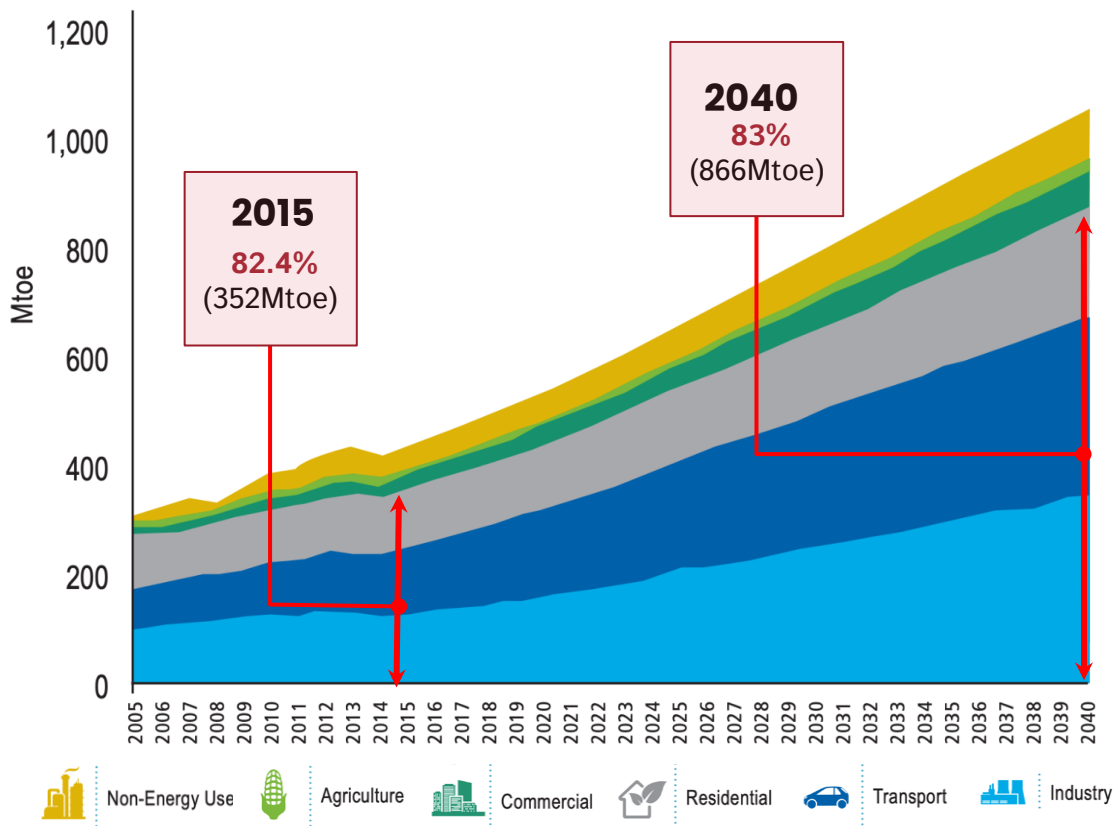
Kilowatt hour are an average production in May which is the highest compare with other..

Electricity demand in household in Cambodia



Source : enerdata and nis.gov.kh

ASEAN electricity consumption by sector



82.4 %

of total consumption are combined by three sectors which accounted for 352 Mtoe in 2015.

83%

of total consumption of these three sectors together represent a nearly unchanged which is also the largest share in 2040.

Source : Southeast Asia Energy Outlook 2019
Source: globalpetrolprices.com 2020



How does **SOLAR ENERGY** surpass other renewable sources of power?

Sustainability is the need of the hour since natural sources are being consumed rapidly. The answer lies in using the sun, water, biomass and wind. It's important to harness them correctly to make maximum use of their capacity. Undoubtedly all renewable sources of energy are beneficial, but solar energy emerges as the most valuable of all.

Here's why solar energy has an advantage when it comes to other renewable sources of energy



SOLAR vs **WIND**

- Solar Power is much more effective and versatile than wind power
- Solar Power can be deployed close to load centers, thus reducing burden on transmission lines



SOLAR vs **HYDRO**

- Solar plants do not modify the environment and can be built in a few months as compared to hydro power plant
- Land or rooftop solar installation can be set up almost anywhere as sunshine in most of India fluctuates far less frequently as against wind or rainfall

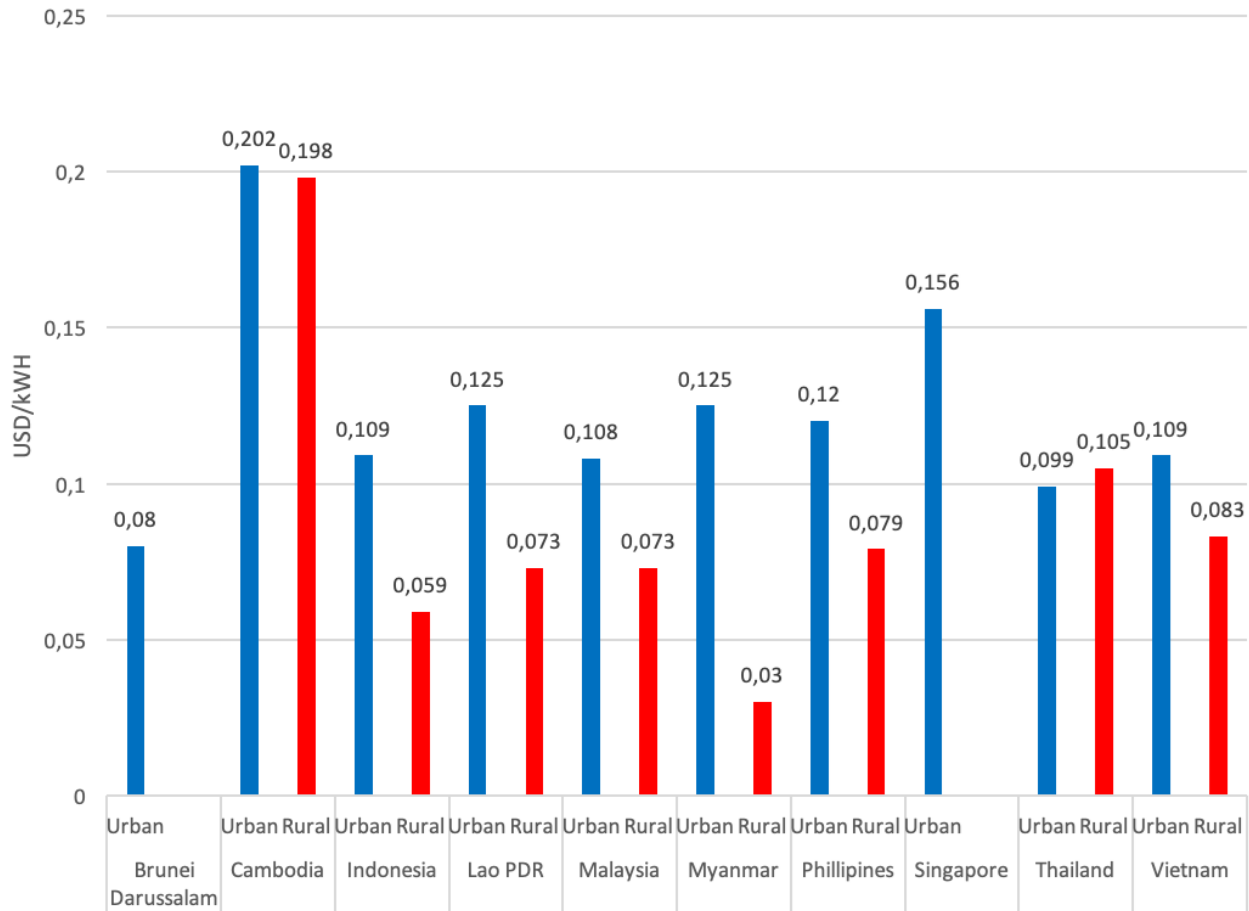


SOLAR vs **BIOMASS**

- Photovoltaic cells are superior compared to biomass as they do not occupy fertile land that could be used for crops
- Biomass also generates volatile organic compounds such as carbon monoxide and nitrogen oxides

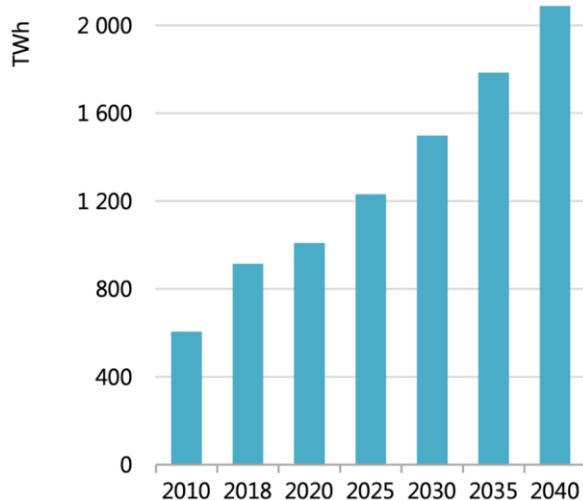
With solar power, you can save electricity and decrease your carbon footprint. The system is also easy to maintain as there are no moving parts. It is at least 20-30% cheaper than the prevailing grid tariffs for most commercial and industrial consumers in India. Solar power is certainly much more beneficial than other sources of renewable energy.

Household Electricity Prices across ASEAN

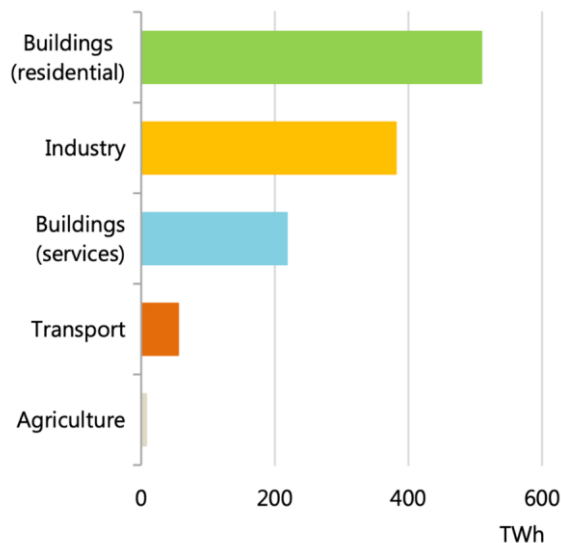


Electricity demand in Southeast Asia

Electricity demand



Change in electricity demand by sector, 2018-40



Source : Southeast Asia Energy Outlook 2019

Residential

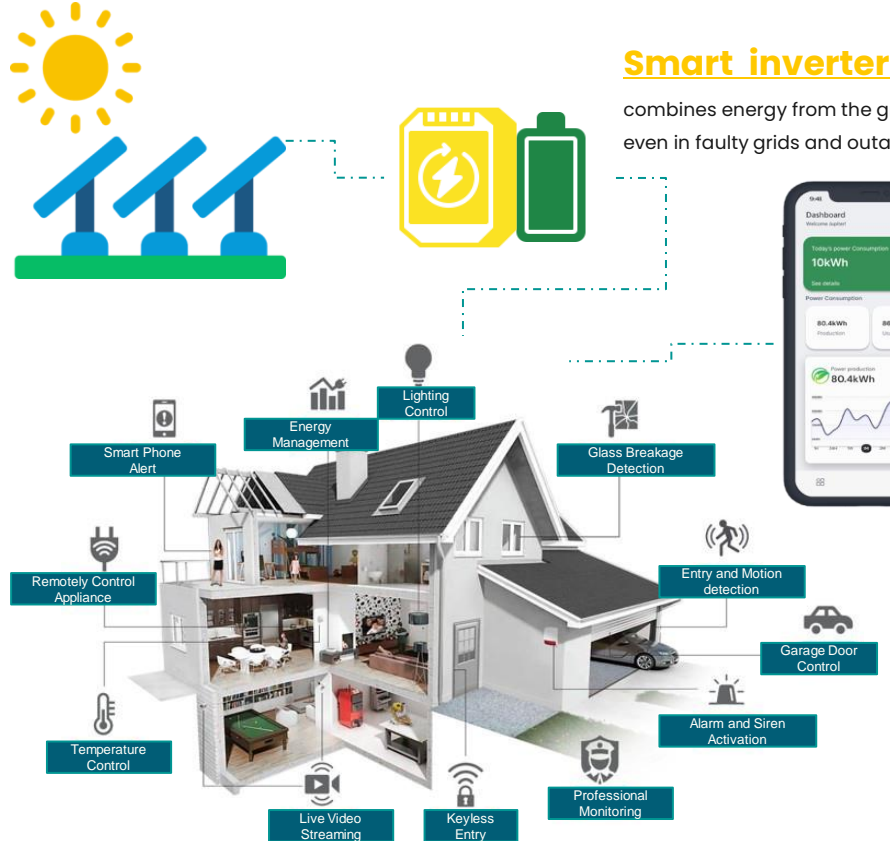
From 2018 to 2040, residential sector is the number 1 sector which consumes electricity the most.

Industrial

Industry consumes the second-highest amount of power from 2018 to 2040.

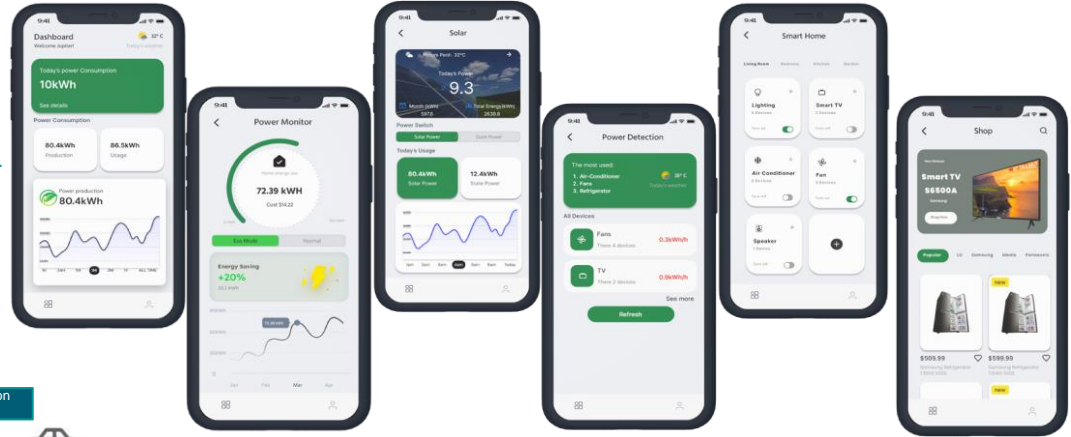
Recommendation

A smart solar grid solution for monetary savings and environmental sustainability



Smart inverter

combines energy from the grid, solar panel and battery to ensure that it provides a nonstop power day and night even in faulty grids and outages.



Home controlling apps

where the user can keep an eye on every aspect of smart Solar system together with all smart devices in your house by just scanning your devices to run a diagnostic on your daily electricity consumption, also a marketplace for user to buy new devices and trade in the undesired devices back to the company in a flash with a perfect deal price.